

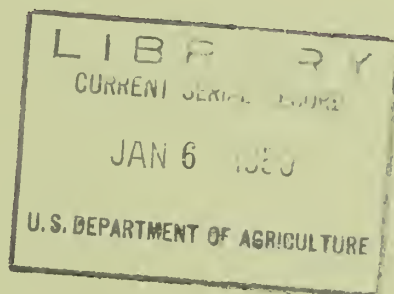
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FEDERAL-STATE COOPERATIVE SNOW SURVEYS and IRRIGATION WATER FORECASTS

for
ARIZONA
February 15, 1949



by
Division of Irrigation, Soil Conservation Service
United States Department of Agriculture

Data included in this report were obtained by the agency named above in cooperation with the Federal, State, and local organizations listed on the last page of this report.

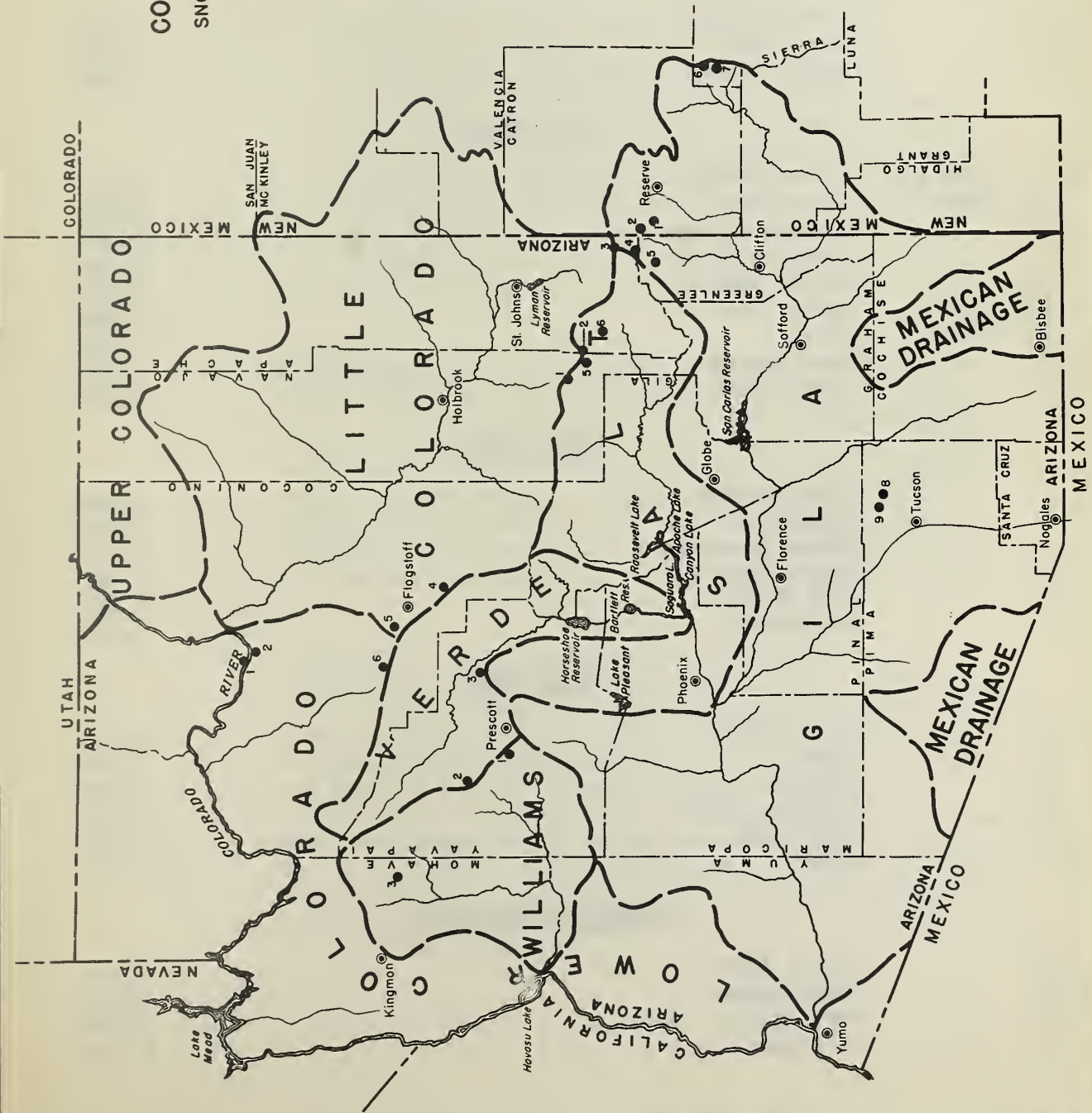
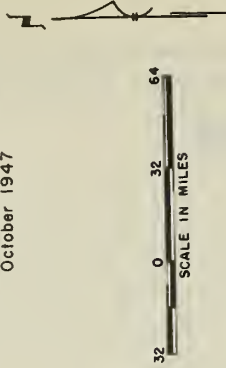
FEDERAL-STATE COOPERATIVE
SNOW SURVEYS AND IRRIGATION WATER FORECASTS
FOR
ARIZONA

Report Prepared
by
Clyde Houston-Irrigation Engineer

Division of Irrigation
Soil Conservation Service
Reno, Nevada

ARIZONA COOPERATIVE SNOW SURVEYS SNOW COURSES AND DRAINAGE BASINS

October 1947



INDEX TO SNOW COURSES

<u>NUMBER</u>	<u>NAME</u>	<u>ELEVATION</u>
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LITTLE COLORADO RIVER

1.	Forest Dale	6,000
2.	McNary	7,200
3.	Nutrioso	8,500
4.	Mormon Lake	7,350
5.	Fort Valley	7,350

WILLIAMS RIVER

1.	Iron Springs	6,200
2.	Camp Wood	5,700
3.	Willow Ranch	5,000

GILA RIVER

1.	(N.M.) Frisco Divide	8,000
2.	(N.M.) State Line	8,000
3.	Nutrioso	8,500
4.	Coronado Trail	8,000
5.	Beaver Head	8,000
6.	(N.M.) Taylor Creek	7,850
7.	(N.M.) Imman	7,800
8.	Rose Canyon	7,300
9.	Bear Wallow	8,100

VERDE RIVER

1.	Iron Springs	6,200
2.	Camp Wood	5,700
3.	Mingus Mountain	7,100
4.	Mormon Lake	7,350
5.	Fort Valley	7,350
6.	Chalender	7,100

SALT RIVER

1.	Forest Dale	6,000
2.	McNary	7,200
3.	Nutrioso	8,500
4.	Coronado Trail	8,000
5.	Milk Ranch	7,000
6.	McKay	8,250

LOWER COLORADO RIVER

1.	Bright Angel	8,400
2.	Grand Canyon	7,500
5.	Fort Valley	7,350
6.	Chalender	7,100

WATER SUPPLY OUTLOOK

Arizona

February 15, 1949

* * * * *
* February 15, 1949 snow surveys indicate a *
* potential flood hazard on practically all *
* mountain streams. Heavy snow storms com- *
* bined with sub-normal temperatures have *
* produced record breaking snow packs. January*
* run-off was extremely high. Although re- *
* servoir storage is much improved, the past *
* drouth was so severe that continued abnorm- *
* ally heavy snowfall is necessary to over- *
* come the water shortage which has been acc- *
* umulating during the past six years. *
* * * * *

Precipitation At the higher elevations of the State January precipitation was abnormally heavy. In general, Little Colorado River Watershed received approximately 200 percent of normal precipitation while that on the head waters of Williams River was about 300 percent. The extremely valuable water producing areas contributing to Verde, Salt, and Gila Rivers received from 350 to 450 percent of normal precipitation during the month. Soil moisture conditions continue very good.

Snow Cover Snow stored water on all snow courses in Arizona was greater on February 15, 1949, than ever before measured during the past ten years of record. Gila River surveys show water stored in snow to be better than three times normal while Salt and Little Colorado are about four times normal. This situation may be attributed to both the abnormally high snowfall and the subnormal temperatures which occurred prior to February 15. A sudden thaw may cause local floods at the higher elevations while a general rain on the existing snow pack may produce flood conditions along the main streams above storage reservoirs.

THE HISTORY OF THE
CITY OF BOSTON

1630-1800

The first settlement in Boston was made by a group of Puritan ministers and laymen who fled from the Massachusetts Bay Colony in 1630. They were led by Rev. John Winthrop, who gave the famous "City upon a Hill" speech. The settlement was initially known as Boston, but was later renamed to Boston. The city grew rapidly and became one of the most important centers of commerce and industry in the New England region. In 1630, the city had a population of about 1,000 people. By 1690, the population had grown to over 10,000 people. The city was a major center of trade and commerce, and was known for its shipbuilding and fishing industries. The city was also a center of education and culture, and was home to many of the most important figures in American history.

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Runoff January runoff was extremely high in many areas of Arizona. Little Colorado River discharged over 2000 percent of median for the month, while the flow of Gila River near Solomonville was more than 1000 percent. Verde and Salt Rivers, were not quite so high, with about 300 and 700 percent of median measured at key gaging stations. Abnormally cold weather at the higher elevations during the early part of February retarded runoff during this period.

Reservoir Storage Reservoir storage continued to improve throughout the Gila River and Central Arizona Systems. San Carlos Reservoir with approximately 162,000 acre feet stored on February 15, contains its greatest amount since 1944. Although this is a welcome improvement much more will be needed to satisfy future requirements for irrigation water. Lake Pleasant contained about 18,000 acre feet which is equivalent to the past 10 year average for this date. Storage on Verde River was about 94,000 acre feet. This is twice the average for the past eight years. Combined storage on Salt River amounted to 330,000 acre feet, which is about 100,000 acre feet more than were stored last year, but only about 50 percent of the 1938-47 average. Lake Mead contained 18,563,000 acre feet while last year on this date there were 19,448,000 acre feet in storage.

TABLE I

ARIZONA SNOW SURVEYS FEBRUARY 15, 1949

DRAINAGE BASIN and SNOW COURSE	LOCATION		SNOW COVER MEASUREMENT								
	Number	Sec. Twp. Rge. Elev.	Date of Survey	Snow Depth (Inches)	Water Content (Inches)			Past Record			
					1949	1948	1947	Years of Record	Av. Water Content (Inches)		
LITTLE COLORADO RIVER											
Forest Dale	1	2	9N 21E	6000	2/14	20.8	6.0	1.7	0	9	0.7
McNary	2	14	8N 23E	7200	2/14	28.0	8.8	2.8	0.4	9	2.6
Nutriosio	3	23	6N 30E	8500	2/15	33.5	9.1	3.2	0.4	9	2.3
Mormon Lake	4	13	18N 8E	7350	2/15	72.5	22.1	6.8	1.7	2	4.3
Fort Valley	5	22	22N 6E	7350	2/15	41.5	11.6	1.0	0	2	0.5
WILLIAMS RIVER											
Iron Springs	1	22	14N 3W	6200	2/12	33.8	10.9	0.5	0	3	0.2
Camp Wood	2	3	16N 6W	5700	2/15	29.0	8.3	0.5	0	3	0.2
Willow Ranch	3	16	21N 11W	5000	2/16	14.5	4.3	0	0	3	0
GILA RIVER											
Frisco Divide	1	31	6S 20W	8000	2/15	24.8	6.3	3.3	0	9	2.0
State Line	2	6	6S 21W	8000	2/15	29.8	8.1	3.2	0	9	3.0
Nutriosio	3	23	6N 30E	8500	2/15	33.5	9.1	3.2	0.4	9	2.3
Coronado Trail	4	26	5N 30E	8000	2/15	38.6	12.4	4.0	0.2	9	3.6
Beaver Head	5	13	4N 30E	8000	2/15	33.7	10.1	No Survey	0	8	3.2
Taylor Creek	6	20	10S 10W	7850	No Report	"		1.8	0	7	0.5
Inman	7	6	11S 10W	7800	"	"		1.3	0	3	0.9
Rose Canyon	8	15	12S 16E	7300	2/15	20.4	4.2	1.5	New Course		
Bear Wallow	9	6	12S 16E	8100	2/15	32.3	7.9	2.2	"		

TABLE I

ARIZONA SNOW SURVEYS FEBRUARY 15, 1949

DRAINAGE BASIN and SNOW COURSE		LOCATION		Number	Sec.	Twp.	Rge.	Elev.	Date of Survey	Snow Depth (Inches)	SNOW COVER MEASUREMENTS				
											Water Content (Inches)		Past Record		
											1949	1948	1947	Years of Record	Av. Water Content (Inches)
VERDE RIVER															
Iron Springs	1	22	14N	3W	6200			2/12	33.8	10.9	0.5	0	3	0.2	
Camp Wood	2	3	16N	6W	5700			2/15	29.0	8.3	0.5	0	3	0.2	
Mingus Mountain	3	3	15N	2E	7100			2/14	29.9	10.8	0.5	0	2	0.3	
Mormon Lake	4	13	18N	8E	7350			2/15	72.5	22.1	6.8	1.7	2	4.3	
Fort Valley	5	22	22N	6E	7350			2/15	41.5	11.6	1.0	0	2	0.5	
Chalender	6	27	22N	3E	7100			2/15	38.1	10.9	3.4	0	2	1.9	
SALT RIVER															
Forest Dale	1	2	9N	21E	6000			2/14	20.8	5.0	1.7	0	9	0.7	
McNary	2	14	8N	23E	7200			2/14	28.0	7.8	2.8	0.4	9	2.6	
Nutriosio	3	23	6N	30E	8500			2/15	33.5	9.1	3.2	0.4	9	2.3	
Coronado Trail	4	26	5N	30E	8000			2/15	38.6	12.4	4.0	0.2	9	3.6	
Milk Ranch	5	28	8N	23E	7000			2/14	21.9	5.1	1.6	0	8	1.2	
LOWER COLORADO RIVER															
Bright Angel	1	34	33N	3E	8400			2/15	57.9	17.9	6.6	New Course			
Grand Canyon	2	21	30N	4E	7500			2/14	33.1	8.9	2.2	"			
Fort Valley	5	22	22N	6E	7350			2/15	41.5	11.6	1.0	0	2	0.5	
Chalender	6	27	22N	3E	7100			2/15	38.1	10.9	3.4	0.3	2	1.9	

TABLE 2

STATUS OF RESERVOIR STORAGE, February 15, 1949

BASIN and STREAM	RESERVOIR	USABLE CAPACITY (Thous. A.F.)	THOUSANDS ACRE FEET IN STORAGE About Feb.15				
			1949	1948	1947	1946	10-Yr. Avg. 1938 -1947
Agua Fria	Lake Pleasant	179	18	1	3	4	18
Colorado	Lake Havasu	688	564	583	629	605	531 ^a
Colorado	Lake Mead	27,935	18,563	19,448	18,561	19,086	19,831 ^a
Gila	San Carlos	1,200	162	1	19	28	223
Salt	Salt River ^c	1,771	330	231	425	725	753
Verde	Bartlett	179	93	3	34	1	53 ^b
Verde	Horseshoe	67	1	11	16	16	New

a - Average for years 1939 - 1947

b - Average for years 1941 - 1947

c - Includes Roosevelt, Apache, Saguaro, and Canyon Lakes

LIST OF SNOW SURVEYORS

<u>SNOW COURSE</u>	<u>SURVEYOR</u>
Forest Dale	W. Fair & M. Woodward
McNary	W. Fair & M. Woodward
Nutriosio	R. L. Diggs
Mormon Lake	M. F. Greaves
Fort Valley	A. P. Loska
Iron Springs	Ernest Saxby
Camp Wood	Mrs. C. C. Merritt
Willow Ranch	Tiny Miller
Frisco Divide	Dean M. Earl
Coronado Trail.	R. L. Diggs
Beaver Head	Jes Burke
Mingus Mountain	Harold Linn
Chalender	Schroeder, Cravens, & Callahan
Milk Ranch	W. Fair & M. Woodward
State Line	Dean M. Earl
Rose Canyon	Wm. Hughes
Bear Wallow	Wm. Hughes
Bright Angel	S. Brown & J. Brown
Grand Canyon	F. Brueck & W. Kennedy

The following organizations cooperate in the Arizona snow survey work:

STATE

Nevada Agricultural Experiment Station
Reno, Nevada

FEDERAL

Department of Agriculture
Forest Service
Apache Forest
Coconino Forest
Coronado Forest
Gila Forest
Kaibab Forest
Prescott Forest
Southwestern Forest and Range Expt.
Station, Fort Valley, Arizona
Soil Conservation Service
Division of Irrigation

Department of Commerce
Weather Bureau
Arizona Section

Department of Interior
Bureau of Reclamation
Region III
Geological Survey
Arizona District
Indian Service
Fort Apache Reservation
National Park Service
Grand Canyon National Park

Gila Water Commissioner
Safford, Arizona

IRRIGATION PROJECTS

Salt River Valley Water Users Association
Phoenix, Arizona

San Carlos Irrigation and Drainage District
Coolidge, Arizona

Other organizations and individuals furnish valuable information for the snow survey reports. Their cooperation is gratefully acknowledged.

THE UNIVERSITY OF CHICAGO
CHICAGO, ILLINOIS

1911

TO THE HONORABLE SENATE
OF THE UNIVERSITY OF CHICAGO

1911

IN RESPONSE TO A RESOLUTION
PASSED BY THE SENATE

AT ITS MEETING OF

DECEMBER 15, 1910

AND IN ACCORDANCE WITH

THE BY-LAWS OF THE UNIVERSITY

OF CHICAGO

AND THE ACTS OF THE LEGISLATURE

OF THE STATE OF ILLINOIS

AND THE DECISIONS OF THE

COURTS OF THE STATE

OF ILLINOIS

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